# P601C

# Stepping Servo Motor Single Axis Controller User's Manual

Made by TROY Enterprise Co., Ltd

TÜV Rheinland/Berlin-Brandenburg TÜV Anlagentechnik GmbH ISO14001 Certificate No.: 09 104 9351

TÜV CERT DIN EN ISO 9001:2000 Certificate: 09 100 99275

**Environment Responsibility**

- TROY is always committed to environment protection. All packaging material is recyclable and reusable.
- If disposing of used product, please recycle by type as per waste disposal procedures.

----------Protect the green earth with your care and commitment----------

※The product is subject to design modification for performance improvement without prior notice. For more details please contact with your local seller.

# Precautions

## Precautions for using

1.Thank you for purchasing TROY products. Please read this user's manual thoroughly before installing and operating the driver, and always keep the manual where it is readily available.

2. The products described in this manual has been designed and manufactured for use in industrial machinery, and must not be used for any other purpose. We are not responsible for any damage caused through failure to observe this warning.

3.Check that the motor, driver and any accessories are all present. If an accessory is missing or damaged, contact the nearest our branches.

4.Never disassemble the motor and driver. Damage or performance impairment may result. Disassembly voids all warranties.

## Precautions for maintenance

Check the ambient environments, clean the system equipment to remove dust and tighten the screws periodically. Also pay attention to the followings.

1. Contact us when repairs become necessary.
2. Since the temperature of the frame of the driver can rise high, be careful when conducting maintenance work or inspection work.

## Precautions for warranty period

Within the period of one year after delivery of the system equipment, when failures occurring from design error or fabrication error attributable to the manufacture side occur, we will be repairing the failure free of charge within the reparable range or will replace with substitute. (We cannot hold ourselves responsible for breakage and accidents occurring from your use beyond the specified range described in this document.)

## Precautions for disposal

When disposing of the driver and the motor, treat them as ordinary industrial waste.

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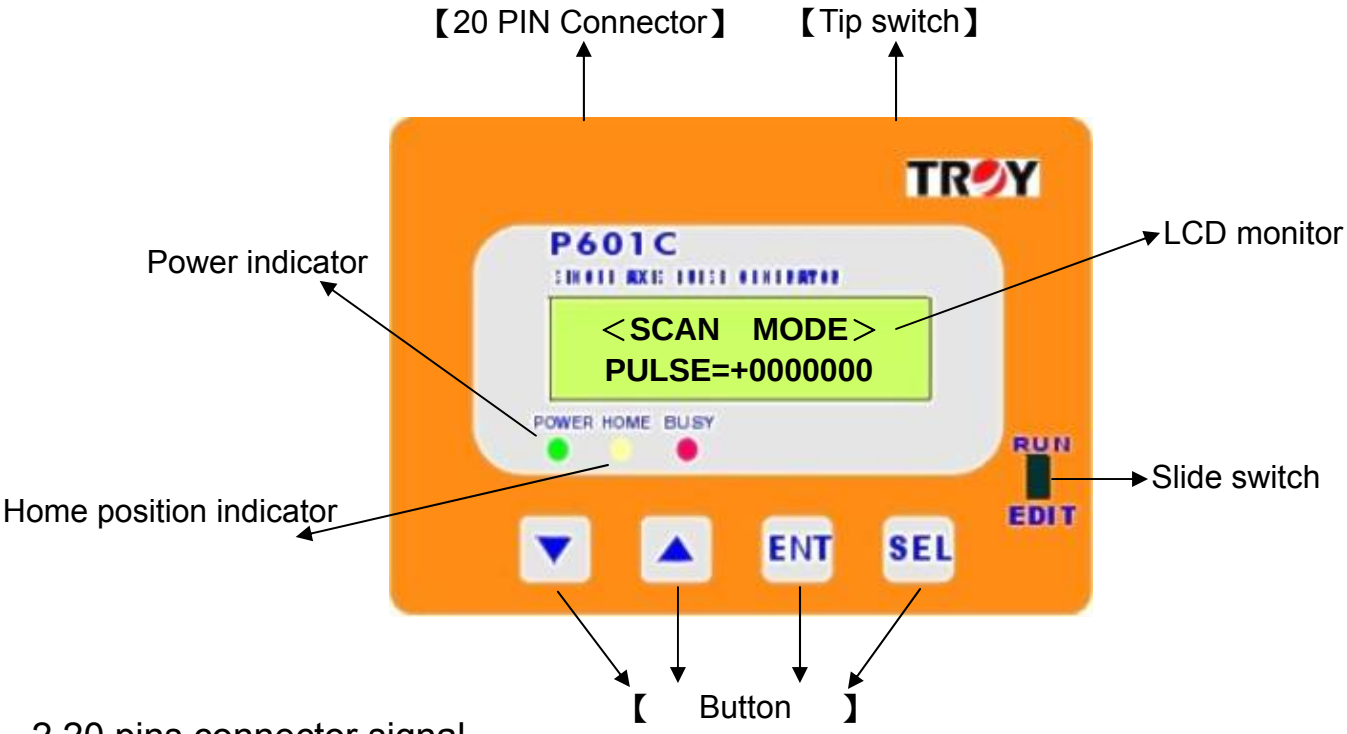
※For any operational or technical question with the product, please contact us for professional service「**0800-450-168**」during our business hours.

## 1.Name of controller parts




## 2.20 pins connector signal

| Pin No. | Input/Output | Name | Function |
|---|---|---|---|
| 1 | Input | 0V | Power input (0V) |
| 2 | Input | +24V | Power input (+24V) |
| 3 | Input | START | Start signal |
| 4 | Input | R/S | H→RUN (Positioning operation)<br>L→SCAN (Continuous operation) |
| 5 | Input | STOP | Emergency stop L→Operation stop<br>H→Operation permissible |
| 6 | Output | BUSY | Output signal during pulse generated (L output) |
| 7 | Output | READY | Output signal during pulse ended (H→L→H) |
| 8 | Input | SEL1 | Positioning option/Continuous operation |
| 9 | Input | SEL2 | Positioning option/Continuous operation |
| 10 | Input | SEL3 | Positioning option |
| 11 | Input | S/L | H→S curve acceleration<br>L→ Linear acceleration |
| 12 | Input | BL | Detection signal input:Counterclockwise rotation limitation |
| 13 | Input | BHL | Detection signal input:Counterclockwise rotation deceleration then stop |
| 14 | Input | ORG | Detection signal input:Mechanical home position |
| 15 | Input | FL | Detection signal input:Clockwise rotation limitation |
| 16 | Input | FHL | Detection signal input:Clockwise rotation deceleration then stop |
| 17 | Output | CW+ | CW pulse output:Connect with driver CW+ |
| 18 | Output | CW- | CW pulse output:Connect with driver CW- |
| 19 | Output | CCW+ | CCW pulse output:Connect with driver CCW+ |
| 20 | Output | CW- | CCW pulse output:Connect with driver CCW- |
| Please do not turn on the power when installed the 20 pins connector（Do not work under live！） | | | L:Terminal connected with 0V<br>H:Terminal OPEN |

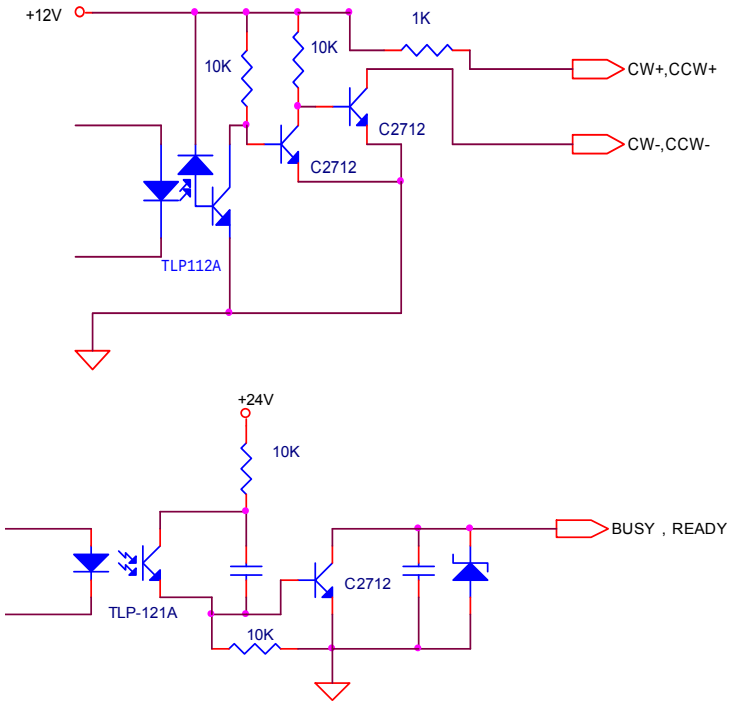
## 3.6 pins tip switch

| No. | Name | Functions | Description |
|---|---|---|---|
| 1 | TEST | TEST MODE | OFF:Normal operation mode<br>ON:TEST mode |
| 2 | FL | Detection mode option:Clockwise rotation limitation | 1.OFF:Normal close detection mode<br>2.ON:Normal open detection mode<br>3.If there is no need 2~6 functions Please switch the tip switch to the ON side. |
| 3 | FHL | Detection mode:Clockwise rotation deceleration then stop | |
| 4 | ORG | Detection mode:Mechanical home position | |
| 5 | BHL | Detection mode:Counterclockwise rotation deceleration then stop | |
| 6 | BL | Detection mode:Counterclockwise rotation limitation | |

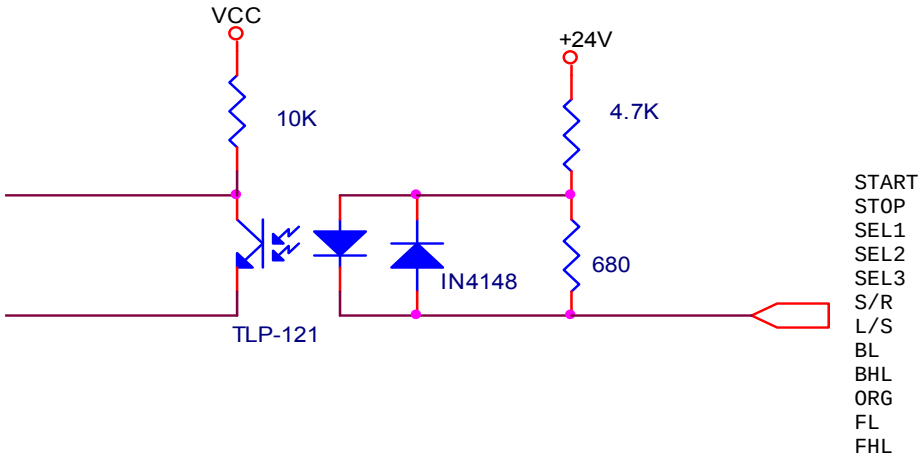
## 4.Specs

| | |
|---|---|
| Position data | 8 sets programs and saved by EEPROM |
| Position control | Per programs:9999999 PULSE<br>Operation pulse speed:35~59995 PPS<br>Start pulse speed:35~9995 PPS<br>Acceleration/deceleration time:1~9999 ms |
| Control mode | External control mode (RUN MODE)<br>Data input mode (EDIT MODE)<br>Test mode (TEST MODE) |
| Operation mode | Positioning operation (INDEX)<br>Mechanical zero return mode (HOME)<br>Continuous operation (SCAN) |
| Input signal | DC 24V photocoupler input,input impendence 4.7KΩ |
| Output signal | DC 24V photocoupler combined with transistor output,output current 25mA |
| Power input | DC 24V/above 82mA |
| Ambient temperature | 0℃~+40℃ |

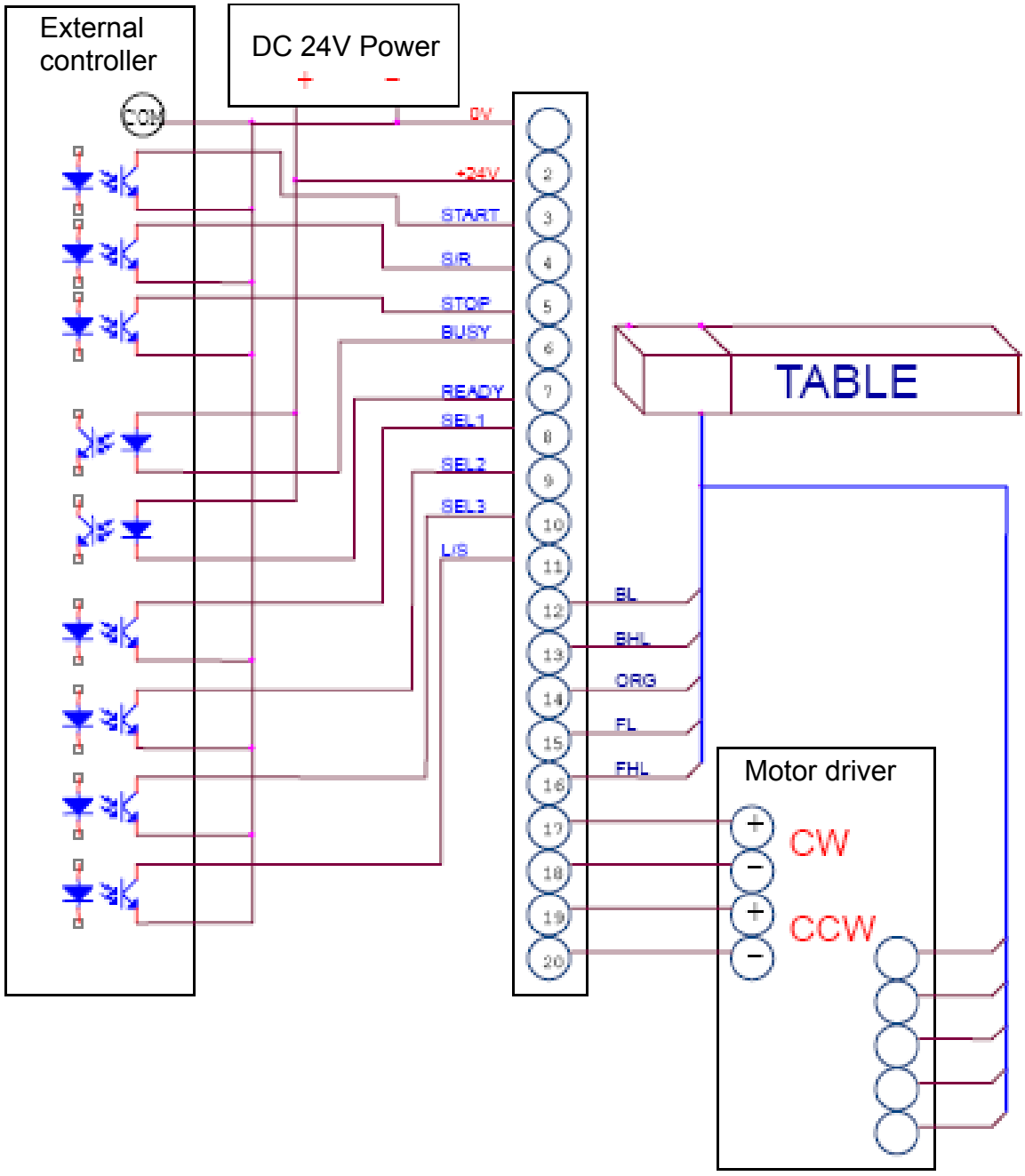
## 5.Internal output circuit




## 6.Internal input circuit



## 7.Wiring


External controller
DC 24V Power
+
−
COM
0V
+24V
START
SIR
STOP
BUSY
READY
SEL1
SEL2
SEL3
LIS
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
BL
BHL
ORG
FL
FHL
TABLE
Motor driver
CW
CCW

## 8.Operation data setting

Before data setting, please switch the slide switch to the EDIT

a. Intialize(Default value)

The controller has defaulted before shipping

After power OFF, switch the slide switch to the EDIT then press the button「ENT」and turn the power ON.

The LED indicated "*DATA-initial*" Please wait……then let the button「EDIT」off, all data initialized and enter into the （EDIT）mode

Initialize data as below:

Common using data

VS(Initial speed)＝130 pps

Tacc/dec(Acceleration/deceleration time)＝30 ms

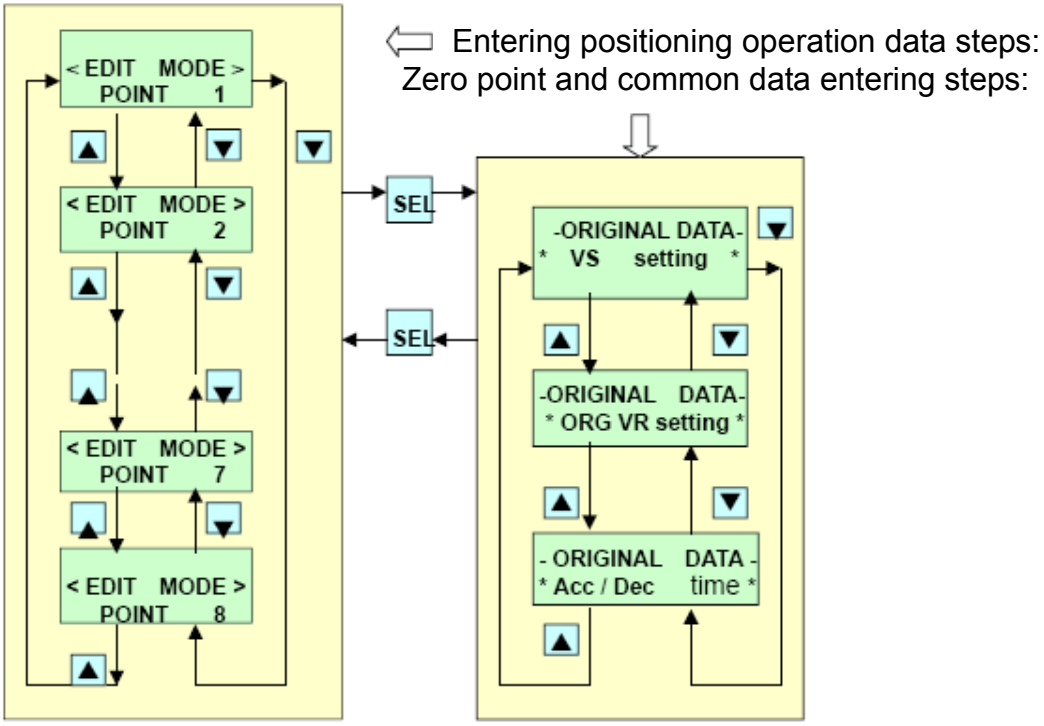
ORG VR(Zero point end speed)＝-1030 pps

INDEX data (POINT 1…….POINT 8)

VR＝＋1030 pps

PULSE＝0000000

b.「EDIT」procedures




⇦ Entering positioning operation data steps:
Zero point and common data entering steps:

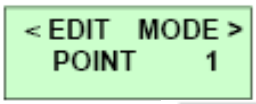
c.EDIT data setting:

The setting mode of positioning operation data as the zero point and common data

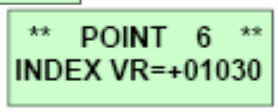
1.Pressing the 「ENT」when LED indicated the above-mentioned items

Pressing the 「ENT」to edit the data

（Editing POINT 1 via VR and PULSE）




2.How to edit the data

Pressing the 「ENT」in any edit item then LED indicated 

and the cursor 「 | 」 will flash at the right side of the LED

・Pressing 「SEL」:Pressing the 「SEL 」once and the cursor moved a space to the left side

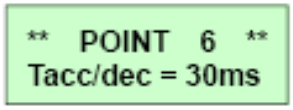
・Pressing「▼」:Pressing the 「▼」the number will decrease 1.When it reach to the min value then it will back to the max value.For example:3→2→1→0→9→8→……

・Pressing「▲」:Pressing the「▲」the number will increase 1 .When it reach to the min value then it will back to the max value.For example:7→8→9→0→1→2→……

＊The cursor at ＋、－ sign and press the 「▲」or「▼」＋→－ or －→＋

＊＋ indicates clockwise rotation(CW),－indicates counterclockwise rotation(CCW)

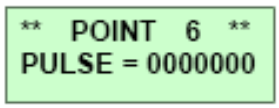
・Pressing 「ENT」:Pressing the 「ENT」to make sure the input value and the LED indicated the following data




The input and edit mode as the above-mentioned steps

This data indicated acceleration /deceleration time（ms）of position point

After edit,pressing the「ENT」to make sure the input value and the LED indicated the following data




The input and edit mode as the above-mentioned steps

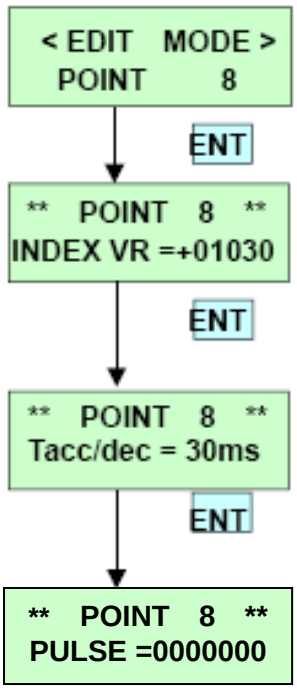
This data indicated pulse numbers of position point

After edit,pressing the「ENT」to make sure the input value

Input procedures please refer to the positioning operation procedures

＋:Clockwise rotation CW

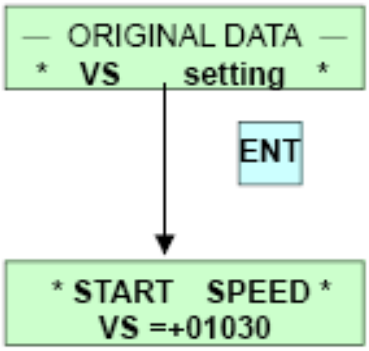
－:Counterclockwise rotation CCW



Zero point and common data(ORIGNIAL DATA)

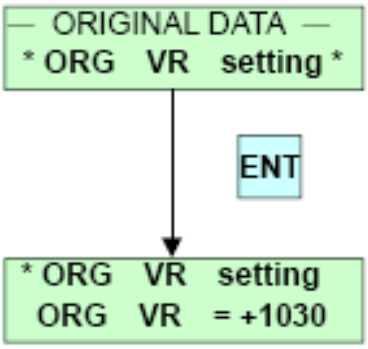
（A）

Input procedures please refer to the zero zero point common data input procedures



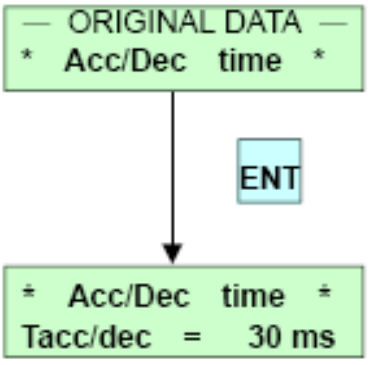

＋:Clockwise rotation CW

－:Counterclockwise rotation CCW




Acceleration/deceleration time related with user's VS and VR

If the Tacc/dec value over the internal value range



## 9.Operation external control

a.Switching the slide switch to the RUN side and control signal input via 20 pins connector

b.Continuous operation

Step1:Pin 4(S/R) connect to 0V→SCAN MODE

Step2:To select the liner acceleration or S shape curve acceleration

Pin 11(L/S) connect to 0V:Liner acceleration

No connect:S shape line acceleration

Step3: Pin 8(SEL1) connect to 0V:CW rotation continuously

No connect:Stop operation

Pin 9(SEL2) connect to 0V:CCW rotation continuously

No connect:Stop operation

c.Zero point return

Step1:Pin 4(S/R) connect to 0V→SCAN MODE

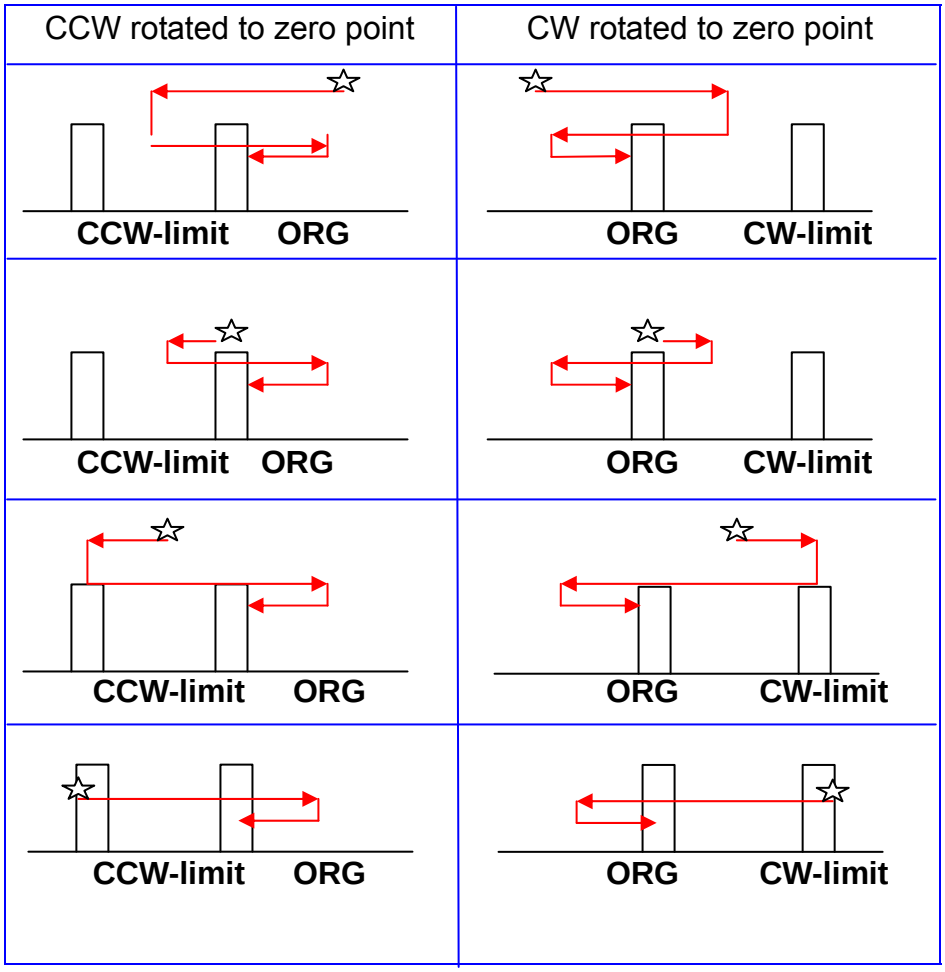
Step2:To select the liner acceleration or S shape curve acceleration

Pin 11(L/S) connect 0V:Liner acceleration

No connect:S shape curve acceleration

Step3: Pin 3(START) connect 0V:Zero point return execution

Pin 5(STOP) connect 0V:Emergency stop



d.Positioning operation

Step1:Pin 4(S/R) no connect→RUN MODE

Step2:To select liner acceleration or S shape curve acceleration

Pin 11(L/S) connect to 0V:Liner acceleration

No connect:S shape curve acceleration

Step3:To select any one step from 1~8 sets programs

| | SEL1 | SEL2 | SEL3 |
|---|---|---|---|
| POINT 1 | No connect | No connect | No connect |
| POINT 2 | L(0V) | No connect | No connect |
| POINT 3 | No connect | L(0V) | No connect |
| POINT 4 | L(0V) | L(0V) | No connect |
| POINT 5 | No connect | No connect | L(0V) |
| POINT 6 | L(0V) | No connect | L(0V) |
| POINT 7 | No connect | L(0V) | L(0V) |
| POINT 8 | L(0V) | L(0V) | L(0V) |

Step4:Pin 3(START) connect to 0V:Operated to the selected position

Pin 5(STOP) connect to 0V:Emergency stop

e.Emergency stop

Pin 5 connect to the 0V:Stop operation under Continuous operation(SCAN MODE)、zero return or positioning operation (RUN MODE)

f.BUSY

When operation pulse output,pin 5(BUSY) is Low output and the light BUSY (red) lit up.Until operation pulse stop output and pin 5(BUSY) becomes Hi,the light BUSY(red) goes off

g.READY

When operation pulse output ended (BUSY L→H),pin 7(READY) will output pulse with width around 50 ms

## 10.Test mode

a.Functions

Operating the continuous operation、zero return or positioning operation

b.Setting

Slide switch switch to the RUN side.Switching tip switch TEST to the ON side

c.Executing

When LED indicated

| < TEST MODE > |
| --- |
| Origin search ? |

which mean wait for execute the zero return

Pressing the following the buttons to select the functions

・Pressing 「▲」:Searching for other operation functions by forward direction

Search HOME→POINT 1→POINT 2→……→POINT 8→SCAN

・Pressing 「▼」:Searching for other operation functions by backward direction

Search HOME→SCAN→POINT 8→POINT 7→……→POINT 1

・Pressing 「ENT」: Executing the function which indicated on the LED

-Search HOME-→Executing zero return

POINT 1→Excuting operation pulse output of INDEX 1

SCAN→Entering the continuous operation mode(SCAN MODE)

Pressing「▲」is clockwise rotation(CW)

Pressing「▼」is counterclockwise rotation(CCW)

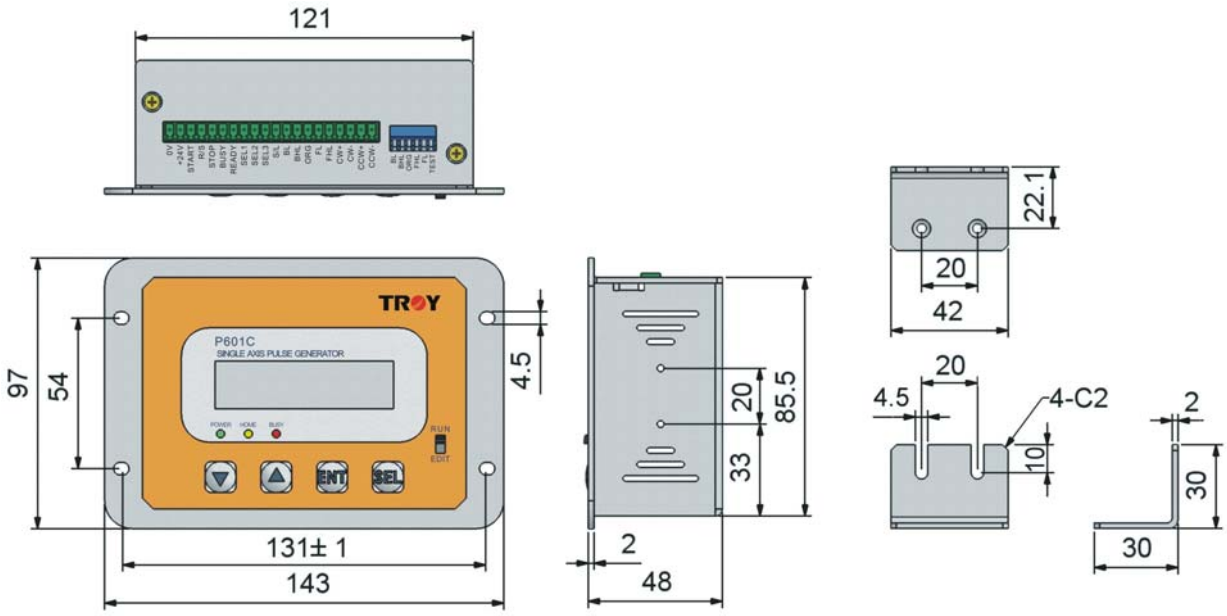
To exit the SCAN MODE,press the 「SEL」

- Under TEST MODE,about the acceleration/deceleration setting,the internal set is S shape curve and it can not set from external

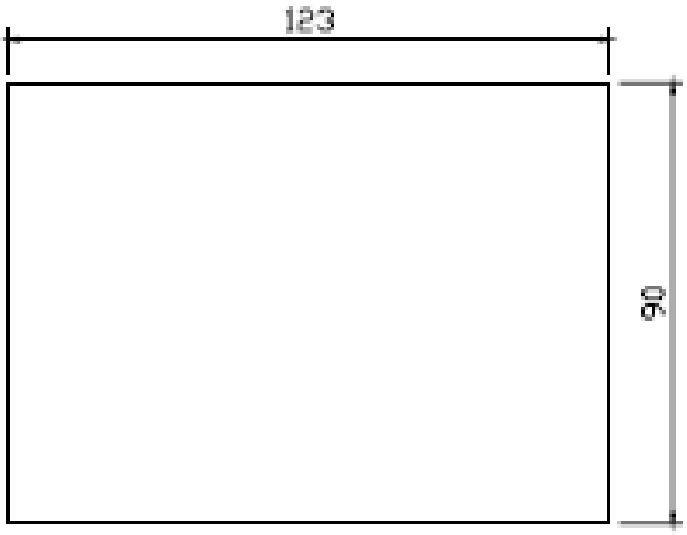
d.To exit TEST MODE

Switching tip switch TEST to the OFF side

## 11.Dimension




## 12.P601C mounting diagram



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